

CLAIMS:

1. Apparatus for performing Orthogonal Polarized Spectral Imaging (OPSI) for imaging objects below the surface of diffuse scattering media, in particular blood capillaries in organs such as the skin of human beings, comprising inter alia at least a light source (1) for providing polarized light, an imaging device (12), a beam splitter (6), a focusing device (7),
5 and means for imaging the object at two different imaging angles.
2. Apparatus according to claim 1, characterized in that the means for imaging the object is formed by two objectives having different imaging angles.
- 10 3. Apparatus according to claim 1, characterized in that the means for imaging the object is formed by a single main objective (7), a scanning mirror (16), and a rotating wedge or two shifting wedges for shifting the imaging beam in its path from the polarizing beam splitter (6) to the imaging device (12).
- 15 4. Apparatus according to claim 1, characterized in that a separate imaging device (12) is provided for each image.
5. Apparatus according to claim 4, characterized in that a shutter is provided for transmitting the two images in alternation.
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6. Apparatus according to claim 5, characterized in that the shutter is located between the polarizing beam splitter (6) and the imaging device (12).
7. Apparatus according to claim 5, characterized in that the shutter is a rotating-
25 aperture shutter.
8. Apparatus according to claim 5, characterized in that the shutter is a liquid crystal cell shutter.

9. Apparatus according to claim 1, characterized in that the two imaging angles differ by 10 to 30 degrees.

10. Apparatus according to claim 1, characterized in that the imaging devices are
5 CCD-cameras.

11. Apparatus according to claim 1, characterized in that the imaging devices are CMOS-sensors.

10 12. Apparatus according to claim 1, characterized in further comprising a data processor for determining a position of the object, the position including at least information about the z-axis which is parallel to the optical axis.

13. Apparatus according to claim 12, characterized in further comprising a
15 spectroscopic analysis system, with a spectroscopic light source and a spectroscopic light beam positioning device for directing the spectroscopic light beam to the object in dependence of the position of the object determined by the data processor.

14. A method for detection of objects below the surface of diffuse scattering
20 media, in particular blood capillaries in organs such as the skin of human beings, using Orthogonal Polarized Spectral Imaging (OPSI), comprising the steps of:
- imaging the object in question at at least two different angles so as to obtain a shift of position in the imaging plane; and
- comparing relative shifts of objects in the two images so as to obtain
25 coordinates of the imaged objects with respect to the organ surface.

15. Method according to claim 14, characterized in that it is determined on the basis of the direction of the shift whether the imaged object is above or below the focal plane.

30 16. Method according to claim 14, characterized in that the distance between the object and the focal plane is calculated from the size of the shift.

17. Method according to claim 1, characterized in that the imaging angle is chosen to be between 10 and 30 degrees.

18. Method according to claim 14, characterized in that a single objective (7) is used for imaging the object.

5 19. Method according to claim 18, characterized in that part of the objective (7) is illuminated with a parallel beam so as to obtain the at least two images.

20. Method according to claim 18, characterized in that the entire objective (7) is illuminated at a defined angle so as to obtain the at least two images.